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09/264,756	03/09/1999	VENKATESH KRISHNAN	10981459-1	3679

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EXAMINER

NGUYEN, DUSTIN

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2154

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/264,756
Filing Date: March 09, 1999
Appellant(s): KRISHNAN ET AL.

Venkatesh Krishnan
For Appellant

Supplemental Examiner's Answer

This is in response to the appeal brief filed 07/13/2004.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

The rejection of claims 20-46 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *References of Record*

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5,848,423	Ebrahim et al.	12-1998
5,999,732	Bak et al.	12-1999
6,295,643	Brown et al.	09-2001
5,787,431	Shaughnessy	07-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 20-46 are rejected under 35 U.S.C. 103. This rejection is set forth in a prior Office Action, mailed on 10/20/2003.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20-22, 25-28, 31, 32, 35-37, 40-41 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bak et al. [US Patent No. 5,999,732], in view of Ebrahim et al. [US Patent No. 5848423].

3. As per claim 20, Bak discloses substantially the invention as claimed including a virtual machine [107, Figure 3], comprising:

class loader that enables the virtual machine to obtain a set of classes via a network as needed while executing an application program [col 6, lines 1-6], the class loader converting the classes obtained via the network into a predefined class definition format and then storing the classes into a class structure in a memory [col 5, lines 18-34], such that the classes stored in the class structure are represented as a set of array and references of the predefined definition format [col 5, lines 34-41];

and to minimize class loading activities on the network [col 1, lines 7-10].

Bak does not disclose memory manager that selects and purges the arrays and references of the classes from the class structure so as to minimize an amount of the memory consumed by the class structure.

Ebrahim discloses the memory manager [garbage collector] that selects and purges the arrays and references of the classes from the class structure so as to minimize an amount of the memory consumed by the class structure [col 2, lines 26-40].

At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow memory to be available for used in new class structures.

4. As per claim 21, Bak discloses the memory manager deletes a set of objects from the memory which are associated with the classes purges form the class structure [col 6, lines 9-17].

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5. As per claim 22, Bak does not disclose a list of associations between the objects and the classes stored in the class structure such that the memory manager deletes the objects in response to the list. Ebrahim discloses a list of associations between the objects and the classes stored in the class structure such that the memory manager deletes the objects in response to the list [Abstract, lines 8-26 and col 9, lines 50-58]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow memory to be available for used in new class structures.

6. As per claim 25, Bak does not disclose a list of hierarchical associations among the classes in the class structure such that the memory manager determines whether the instances of the parent class or of the child class are not being used in response to the list. Ebrahim discloses the list of hierarchical associations among the classes in the class structure such that the memory manager determines whether the instances of the parent class or of the child class are not being used in response to the list [col 9, lines 60-col 10, lines 7]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow memory to be available for used in new class structures.

7. As per claim 26, Bak does not disclose the memory manager purges the classes from the class structure at periodic times. Ebrahim discloses the memory manager purges the classes from the class structure at periodic times [col 2, lines 40-43]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow the system to maintain its peak performance at all time.

8. As per claim 27, Bak does not disclose the memory manager purges the classes from the class structure if an amount of available memory falls below a predetermined threshold level. Ebrahim discloses the memory manager purges the classes from the class structure if an amount of available memory falls below a predetermined threshold level [col 2, lines 44]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow the system to maintain its peak performance at all time.

9. As per claim 28, Bak does not disclose the memory manager purges the classes from the class structure during system idle periods. Ebrahim discloses the memory manager purges the classes from the class structure during system idle periods [col 2, line 42-43]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak and Ebrahim because it would allow the system to maintain its peak performance at all time.

10. As per claims 31, 32, 35-37, they are method claims of claims 20, 21, and 26-28, they are rejected for similar reasons as stated above in claims 20, 21, and 26-28.

11. As per claim 40, it is apparatus claim of claim 20, it is rejected for similar reason as stated in claim 1. Furthermore, Bak discloses memory that holds a class structure for storing a set of classes for use when executing an application program [53, Figure 2].

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12. As per claim 41, it is apparatus claim of claim 21, it is rejected for similar reason as stated in claim 21.

13. As per claims 44-46, they are apparatus of claims 26-28, they are rejected for similar reasons as stated in claims 26-28.

14. Claims 23, 24, 33, 34, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bak et al. [US Patent No. 5,999,732], in view of Ebrahim et al. [US Patent No 5848423], and further in view of Shaughnessy [US Patent No. 5787431].

15. As per claims 23 and 24, Bak and Ebrahim do not disclose the memory manager selects a least recently used class in the class structure and purges the arrays and references of the least recently used class from the class structure if an instance of the least recently used class is not being used by the application program. Shaughnessy discloses the memory manager selects a least recently used class in the class structure and purges the arrays and references of the least recently used class from the class structure if an instance of the least recently used class is not being used by the application program [col 4, lines 57-64]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Shaughnessy because it would allow memory to be available for used in new class structures.

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16. As per claim 33, it is method claim of claim 23, it is rejected for similar reason as stated above in claim 23.

17. As per claim 34, Bak and Ebrahim do not disclose the step of determining whether an instance of the least recently used class is being used comprises the step of determining whether an instance of the least recently used class or of a parent class or of a child class of the least recently used class is being used by the application program. Shaughnessy discloses the step of determining whether an instance of the least recently used class is being used comprises the step of determining whether an instance of the least recently used class or of a parent class or of a child class of the least recently used class is being used by the application program [col 10, lines 14-19]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Shaughnessy because it would allow memory to be used for new class structures.

18. As per claims 42 and 43, they are apparatus of claims 23 and 24, they are rejected for similar reasons as stated above in claims 23 and 24.

19. Claims 29, 30, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bak et al. [US Patent No. 5,999,732], in view of Ebrahim et al. [US Patent No. 5848423], and further in view of Brown et al [US Patent No 6295643].

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20. As per claim 29, Bak and Ebrahim do not disclose the class loader obtains the classes from an HTTP server that exports a set of class files containing one or more of the classes.

Brown discloses the class loader obtains the classes from an HTTP server that exports a set of class files containing one or more of the classes [514, Figure 5]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Brown because it would allow class structure to be more easily maintained and portable for other systems to access.

21. As per claim 30, Bak and Ebrahim do not disclose the virtual machine is provided with a class definition statement that specifies one or more URLs for the class files. Brown discloses the virtual machine is provided with a class definition statement that specifies one or more URLs for the class files [col 1, lines 50-62]. At the time the invention was made, it would have been obvious to a person skill in the art to combine Bak, Ebrahim and Brown because it would allow class structure to be more easily maintained and portable for other systems to access.

22. As per claims 38 and 39, they are method claims of claims 29 and 30, they are rejected for similar reasons as stated in claims 29 and 30.

(11) Response to Argument

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1. As per arguments, Applicants' argued that (1) Bak and Ebrahim do not disclose or suggest obtaining a set of classes via a network as needed while executing an application program as claimed in claims 20, 31 and 40.

2. As to point (1), Bak discloses a set of classes [i.e. Java classes] [col 5, lines 24-30], the set of classes is obtained [i.e. retrieve and store] via a network as mentioned in

“Cabinet 7 houses a CD-Rom drive, system memory and hard drive may be utilized to store and retrieve software programs incorporating computer code that implements the invention, data for use with the invention [i.e. classes], and the like. Although the CD-ROM is shown as an exemplary computer readable storage medium, Additionally, a data signal embodied in a carrier wave (e.g. in a network including the Internet) may be the computer readable storage medium.” [col 4, lines 29-45].

Bak discloses obtaining a set of classes via a network as needed while executing an application [i.e. dynamically loaded classes at runtime only when they are needed] [col 2, lines 9-11]. Furthermore, Bak mentions Java bytecodes or class files is platform independent and can be executed on any computer [col 1, lines 28-35].

In addition, Applicants' specification on line 1-9, page 2, Applicants admit that prior Java virtual machines typically load a set of predefined classes from class libraries contained in a local or a remote file system [i.e. via a network].

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3. As per arguments, Applicants' argued that (2) Bak and Ebrahim do not disclose or suggest selecting and purging arrays and references from a class structure as claimed in claims 20, 31 and 40.

4. As to point (2), Ebrahim discloses a system that recovers memory used by objects no longer in use by the operating system and application programs in a computer system [col 1, lines 6-9]. Ebrahim teaches array and references [i.e. data array and object references] [Figure 4A; and col 7, lines 25-36]. In addition, Ebrahim discloses selecting and purging array and references [i.e. identify and locate to recover unused memory] from a class structure [i.e. heap] [Abstract; col 2, lines 36-49; and col 4, lines 64-67].

5. As per arguments, Applicants' argued that (3) Bak and Ebrahim do not disclose or suggest selecting and purging arrays and references from a class structure so as to minimize an amount of memory consumed by the class structure while also minimizing class loading activities on a network as claimed in claims 20, 31 and 40.

6. As per point (3), Ebrahim discloses selecting and purging arrays and references from a class structure as discussed in point (2) above. Ebrahim further discloses the method of selecting and purging arrays and references from a class structure so as to minimize an amount of memory consumed by the class structure [i.e. recover unused memory] [col 1, lines 6-9; and col 2 lines 36-49]. In addition, as discussed in point (1) above, Bak discloses the limitation of class loading

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activities on a network. Furthermore, Bak discloses the method also minimizing class loading [i.e. reducing the cost of dynamic class loading] [col 2, lines 14-16].

7. As per dependent claims 21-30, 32-39, and 41-46, they are not patentable at least for the reasons set forth above in claims 20, 31, and 40.


For the above reasons, it is believed that the rejections should be sustained.


Respectfully submitted,

Dustin Nguyen
Examiner
Art Unit 2154

November 4, 2005

 JOHN FOLLANSBEE
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Approved:

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